This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Minor, Municipal permit. The discharge results from the operation of a 0.02 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS at 9VAC25-260 et seq (effective January 6, 2011) and updating permit language, as appropriate, to reflect current boilerplate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1. Facility Name and Mailing Address: Rapidan Baptist Camp WWTP, P.O. Box 10, Rochelle, VA 22738 — SIC Code: 4952 WWTP

   Facility Location: 177 Baptist Camp Drive, Rochelle, VA 22738 — County: Madison

   Facility Contact Name: Wayne Leighan — Telephone Number: (540) 672-0426

   Facility E-mail Address: wleighan@camprapidan.com

2. Permit No.: VA0060879 — Expiration Date of previous permit: June 12, 2016

   Other VPDES Permits associated with this facility: None

   Other Permits associated with this facility: None

   E2/E3/E4 Status: Not Applicable

3. Owner Name: Rapidan Baptist Camp

   Owner Contact/Title: Kelly Earles, Director — Telephone Number: (540) 672-0426

4. Application Complete Date: December 3, 2015

   Permit Drafted By: Alison Thompson — Date Drafted: 3/17/2016

   Draft Permit Reviewed By: Doug Frasier — Date Reviewed: 3/21/2016

   Public Comment Period: Start Date: 4/21/2016 — End Date: 5/23/2016

5. Receiving Waters Information: See Attachment 1 for the Flow Frequency Determination

Receiving Stream Name:	Rapidan River, UT	Stream Code:	3-XBO
Drainage Area at Outfall:	4.02 sq.mi.	River Mile:	0.52
Stream Basin:	Rappahannock	Subbasin:	Not Applicable
Section:	4	Stream Class:	III
Special Standards:	None	Waterbody ID:	VAN-E13R/RA27
7Q10 Low Flow:	0.09 MGD	7Q10 High Flow:	0.48 MGD
1Q10 Low Flow:	0.07 MGD	1Q10 High Flow:	0.39 MGD
30Q10 Low Flow:	0.16 MGD	30Q10 High Flow:	0.66 MGD
Harmonic Mean Flow:	1.00 MGD	30Q5 Flow:	0.23 MGD

6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

- ✓ State Water Control Law
- ✓ Clean Water Act
- ✓ VPDES Permit Regulation
- ✓ EPA NPDES Regulation
- ✓ EPA Guidelines
- ✓ Water Quality Standards
- ___ Other

7. Licensed Operator Requirements: Class IV

8. Reliability Class: Class II

9. Permit Characterization:

✓ Private	___ Effluent Limited	___ Possible Interstate Effect
___ Federal	✓ Water Quality Limited	___ Compliance Schedule Required
___ State	___ Toxics Monitoring Program Required	___ Interim Limits in Permit
___ POTW	___ Pretreatment Program Required	___ Interim Limits in Other Document
✓ TMDL	✓ e-DMR Participant	

10. **Wastewater Sources and Treatment Description:**

Raw sewage is collected from five points at the campground and is gravity fed to the extended aeration package plant. The sources of domestic wastewater are the summer campground, conference center and director's residence. Wastewater passes through a manual bar screen prior to the aeration chamber. From the aeration unit, flow enters a clarifier. The RAS is pumped back to the extended aeration while the WAS is pumped to a holding tank. Flow then enters a 70,000 gallon polishing pond for further treatment. The overflow from the pond flows to the chlorination unit which consists of tablet feeders and a chlorine contact tank to ensure adequate disinfection. Effluent passes over a V-notch weir into the post aeration tank consisting of three air diffusers. After post aeration, the effluent is dechlorinated via a tablet feeder prior to discharge.

See Attachment 2 for a facility schematic/diagram.

TABLE 1 – Outfall Description

Outfall Number	Discharge Sources	Treatment	Design Flow	Outfall Latitude and Longitude
001	Domestic	See Item 10 above.	0.02 MGD	**38° 16' 53"** N **77° 18' 00"** W
See Attachment 3 for (Rochelle Quad) topographic map.				

11. **Sludge Treatment and Disposal Methods:**

There is no sludge treatment at this facility; storage only. Sludge is pumped and hauled to the Moores Creek Regional STP in Charlottesville, Virginia, for final treatment and disposal.

12. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge:

TABLE 2 – Items of Interest	
NA	Town of Orange – water intake for potable water intake. Located approximately 14.8 miles downstream.
3-XBO00.26	DEQ Ambient Monitoring Station located 0.17 mile downstream of Outfall 001 on the unnamed tributary to the Rapidan River.
VA0053121	Outfall 001 for the Town of Orange Water Treatment Plant – Poplar Run. Located approximately 15.3 miles downstream.
VA0021385	Town of Orange WWTP – Rapidan River. Located approximately 15.0 miles downstream.
VA0027839	Woodberry Forest School – Outfall 001 (WWTP effluent) & Outfall 002 (WTP effluent) – Rapidan River. Located approximately 20.3 miles downstream.

13. Material Storage:

TABLE 3 - Material Storage		
Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
Chlorine tablets	(2) 5-gallon buckets	Under roof
Dechlorination tablets	(2) 5-gallon buckets	Under roof
Soda Ash	(2) 50 pound bags	Under roof
Polymer	(4) 1-gallon buckets	Under roof

14. Site Inspection:

Performed by DEQ Compliance staff on September 28, 2005 (Attachment 4).

15. Receiving Stream Water Quality and Water Quality Standards:

a) Ambient Water Quality Data

This facility discharges to an unnamed tributary to Rapidan River (streamcode XBO); DEQ ambient monitoring station 3-XBO00.26 is located approximately 0.17 mile downstream from Outfall 001. No samples have been collected at this monitoring station since 2003 and there are no other DEQ ambient monitoring stations within the vicinity of this facility that have recent monitoring data. The following is the water quality summary for this segment of stream XBO, as taken from the Draft 2014 Integrated Report:

Class III, Section 4.

DEQ monitoring stations located in this segment:
-ambient monitoring station 3-XBO000.26, at Route 621.

Although the fecal coliform bacteria criteria are no longer being used for assessment purposes, there has been no or insufficient E. coli bacteria monitoring along this assessment unit reach. The fecal coliform impairment formerly associated with this assessment unit will remain. The recreation use is considered not supported. This impairment is nested within the downstream completed bacteria TMDL for the Rapidan River.

The aquatic life and wildlife uses are considered fully supporting. The fish consumption use was not assessed.

b) 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

TABLE 4 - 303(d) Impairment and TMDL information for the receiving stream segment

Waterbody Name	Impaired Use	Cause	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the DRAFT 2014 Integrated Report						
Rapidan River, UT	Recreation	*E. coli*	Rapidan River bacteria TMDL 12/05/2007	3.48E+10 cfu/year *E. coli*	126 cfu/100 ml *E. coli* --- 0.020 MGD	---

Significant portions of the Chesapeake Bay and its tributaries are listed as impaired on Virginia's 303(d) list of impaired waters for not meeting the aquatic life use support goal, and the draft 2012 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report indicates that much of the mainstem Bay does not fully support this use support goal under Virginia's Water Quality Assessment guidelines. Nutrient enrichment is cited as one of the primary causes of impairment. EPA issued the Bay TMDL on December 29, 2010. It was based, in part, on the Watershed Implementation Plans developed by the Bay watershed states and the District of Columbia.

The Chesapeake Bay TMDL addresses all segments of the Bay and its tidal tributaries that are on the impaired waters list. As with all TMDLs, a maximum aggregate watershed pollutant loading necessary to achieve the Chesapeake Bay's water quality standards has been identified. This aggregate watershed loading is divided among the Bay states and their major tributary basins, as well as by major source categories [wastewater, urban storm water, onsite/septic agriculture, air deposition]. Fact Sheet Section 17.e provides additional information on specific nutrient monitoring for this facility to implement the provisions of the Chesapeake Bay TMDL.

The planning statement can be found in Attachment 5.

c) Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, an unnamed tributary to the Rapidan River, is located within Section 04 of the Rappahannock River Basin, and classified as a Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

The Freshwater Water Quality/Wasteload Allocation Analysis (Attachment 6) details other water quality criteria applicable to the receiving stream.

Some Water Quality Criteria are dependent on the temperature and pH and Total Hardness of the stream and final effluent. The stream and final effluent values used as part of Attachment 6 are as follows:

pH and Temperature for Ammonia Criteria:
The fresh water, aquatic life Water Quality Criteria for Ammonia are dependent on the in-stream temperature and pH. The 90th percentile temperature and pH values are used because they best represent the critical conditions of the receiving stream. Staff has re-evaluated the receiving stream ambient monitoring data for pH and temperature (Attachment 6) and finds no significant differences from the data used to establish ammonia criteria and subsequent effluent limits in the previous permit. Therefore, the

previously established pH (7.7 s.u.) and temperature (26.1 C) stream values will be carried forward as part of this reissuance process. A default temperature value of 15° C was used for the stream for the high flow ammonia criteria.

During the last reissuance, staff reviewed the daily pH data from the effluent from June 2008 through August 2010. The 90th percentile pH of the discharge was determined to be 8.26 S.U. This value was compared to the minimum and maximum pH values reported on the DMRs from January 2011 through January 2016 (Attachment 6). It is staff's best professional judgment that this value is still appropriate and it shall be used in the development of the ammonia criteria presented in Attachment 6. A default temperature value of 20° C was used for the effluent for the annual ammonia criteria, and a default temperature value of 15° C was used for the effluent for the high flow ammonia criteria.

Total Hardness for Hardness-Dependent Metals Criteria:
The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/l calcium carbonate). There is no hardness data for this facility or for the stream. Staff guidance suggests using a default hardness value of 50 mg/L $CaCO_3$ for streams east of the Blue Ridge. The hardness-dependent metals criteria in Attachment 6 are based on this value.

Bacteria Criteria:
The Virginia Water Quality Standards (9VAC25-260-170A.) states that the following criteria shall apply to protect primary recreational uses in surface waters:

1) *E. coli* bacteria per 100 ml of water shall not exceed a monthly geometric mean of the following:

	Geometric Mean[1]
Freshwater *E. coli* (N/100 ml)	126

[1]For a minimum of four weekly samples [taken during any calendar month].

d) Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Rapidan River, UT, is located within Section 04 of the Rappahannock River Basin. This section has not been designated with a special standard.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 1 based on an evaluation of the dissolved oxygen model used to set the effluent limitations. The model was run to meet the Water Quality Criteria for dissolved oxygen. Permit limits proposed have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are the calculated on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a) Effluent Screening:
Effluent data obtained from DMRs has been reviewed and determined to be suitable for evaluation. The facility has received three Warning Letters in 2014 and 2015. Two were for TSS exceedances and one was for Chlorine exceedances. The facility has responded to these and corrected the problems.

The following pollutants require a wasteload allocation analysis: Ammonia as N and Total Residual Chlorine.

b) Mixing Zones and Wasteload Allocations (WLAs):
Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f) (Q_s)] - [(C_s) (f) (Q_s)]}{Q_e}$$

Where:
- WLA = Wasteload allocation
- C_o = In-stream water quality criteria
- Q_e = Design flow
- f = Decimal fraction of critical flow from mixing evaluation
- Q_s = Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for chronic ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
- C_s = Mean background concentration of parameter in the receiving stream.

The Water Quality Standards contain two distinct mixing zone requirements. The first requirement is general in nature and requires the "use of mixing zone concepts in evaluating permit limits for acute and chronic standards in 9VAC25-260-140.B". The second requirement is specific and establishes special restrictions for regulatory mixing zones "established by the Board".

The Department of Environmental Quality uses a simplified mixing model to estimate the amount of mixing of a discharge with the receiving stream within specified acute and chronic exposure periods. The simplified model contains the following assumptions and approximations:

- The effluent enters the stream from the bank, either via a pipe, channel or ditch.
- The effluent velocity isn't significantly greater (no more than 1 - 2 ft/sec greater) than the stream velocity.
- The receiving stream is much wider than its depth (width at least ten times the depth).
- Diffusive mixing in the longitudinal direction (lengthwise) is insignificant compared with advective transport (flow).
- Complete vertical mixing occurs instantaneously at the discharge point. This is assumed since the stream depth is much smaller than the stream width.
- Lateral mixing (across the width) is a linear function of distance downstream.
- The effluent is neutrally buoyant (e.g. the effluent discharge temperature and salinity are not significantly different from the stream's ambient temperature and salinity).
- Complete mix is determined as the point downstream where the variation in concentration is 20% or less across the width and depth of the stream.
- The velocity of passing and drifting organisms is assumed equal to the stream velocity.

If it is suitably demonstrated that a reasonable potential for lethality or chronic impacts within the physical mixing area doesn't exist, then the basic complete mix equation, with 100% of the applicable stream flow, is appropriate. If the mixing analysis determines there is a potential for lethality or chronic impacts within the physical mixing area, then the proportion of stream flow that has mixed with the effluent over the allowed exposure time is used in the basic complete mix equation. As such, the wasteload allocation equation is modified to account for the decimal fraction of critical flow (f).

Staff derived wasteload allocations where parameters are reasonably expected to be present in an effluent (e.g., total residual chlorine where chlorine is used as a means of disinfection) and where effluent data indicate the pollutant is present in the discharge above quantifiable levels. With regard to the Outfall 001 discharge, ammonia as N is likely present since this is a WWTP treating sewage, and total residual chlorine may be present since chlorine is used for disinfection are present in the discharge. As such, Attachment 6 details the mixing analysis results and WLA derivations for these pollutants.

c) Effluent Limitations Toxic Pollutants, Outfall 001 –

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N:

Staff reviewed the effluent pH and has concluded it is not significantly different than what was used previously to derive ammonia criteria. DEQ guidance suggests using a sole data point of 9.0 mg/L for discharges containing domestic sewage to ensure the evaluation adequately addresses the potential for ammonia to be present in the discharge containing domestic sewage.

The current evaluation shows that no limit is necessary for ammonia during the low flow season. Due to antibacksliding considerations and since the facility is meeting the current limitations; staff proposes that the existing limitations be carried forward with the reissued permit (Attachment 7).

Also, the facility should be aware that the Environmental Protection Agency (EPA) finalized new, more stringent ammonia criteria in August 2013; possibly resulting in significant reductions in ammonia effluent in NPDES Discharge Permits. It is staff's best professional judgment that incorporation of these criteria into the Virginia Water Quality Standards is forthcoming. This and many other facilities may be required to comply with these new criteria during their next respective permit terms, so any minor changes in the Ammonia as N effluent limitations would be counterproductive to the new EPA ammonia criteria.

2) Total Residual Chlorine:

Chlorine is used for disinfection and is potentially in the discharge. Staff calculated WLAs for TRC using current critical flows and the mixing allowance. In accordance with current DEQ guidance, staff used a default data point of 0.2 mg/L and the calculated WLAs to derive limits. The current limit evaluation shows that the limits could be relaxed, but since the facility has been meeting the existing limitations and because of antibacksliding considerations, the existing limitations are proposed to be carried forward with this reissuance. A monthly average of 0.025 mg/L and a weekly average limit of 0.030 mg/L are proposed for this discharge (Attachment 7).

d) Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to dissolved oxygen (D.O.), biochemical oxygen demand-5 day (BOD_5), total suspended solids (TSS), Ammonia as N (June-November), Total Residual Chlorine, and pH limitations are proposed.

Dissolved Oxygen and BOD_5 limitations are based on the stream modeling conducted in November 1973 (Attachment 8) and are set to meet the water quality criteria for D.O. in the receiving stream.

It is staff's practice to equate the Total Suspended Solids limits with the BOD_5 limits. TSS limits are established to equal BOD_5 limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

E. coli limitations are in accordance with the Water Quality Standards 9VAC25-260-170. This facility has an allocation in the approved Bacteria TMDL for the Rapidan River. This discharge is intermittent in nature and typically occurs from June to August each year. A review of the geometric mean reported on DMRs from January 2011 through January 2016 shows that July is the month with the most frequent discharges. It is staff's best professional judgment that *E. coli* monitoring be conducted 1/week during July of each year to demonstrate compliance with the Water Quality Standards and the wasteload allocation in the approved TMDL.

e) Effluent Annual Average Limitations and Monitoring, Outfall 001 – Nutrients

VPDES Regulation 9VAC25-31-220(D) requires effluent limitations that are protective of both the numerical and narrative water quality standards for state waters, including the Chesapeake Bay.

As discussed in Section 15, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Virginia has committed to protecting and restoring the Bay and its tributaries.

Nonsignificant dischargers are subject to aggregate wasteload allocations for Total Nitrogen (TN), Total Phosphorus (TP), and Sediments under the Total Maximum Daily Load (TMDL) for the Chesapeake Bay. Monitoring for Total Nitrogen, Total Phosphorus and Total Suspended Solids is required in order to verify the aggregate wasteload allocations assumptions that were used in the initial calculations for the TMDL. Annual monitoring for Nitrates + Nitrites, Total Kjeldahl Nitrogen, Total Nitrogen, and Total Phosphorus are included in this permit.

f) Effluent Limitations and Monitoring Summary.

The effluent limitations are presented in the following table. Limits were established for BOD_5, Total Suspended Solids, Ammonia as N, pH, Dissolved Oxygen, Total Residual Chlorine, and *E. coli*. Monitoring for Flow, Nitrates + Nitrites, Total Kjeldahl Nitrogen, Total Nitrogen, and Total Phosphorus are also included in this permit.

The limit for Total Suspended Solids is based on Best Professional Judgment.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/l), with the flow values (in MGD) and a conversion factor of 3.785.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for BOD and TSS (or 65% for equivalent to secondary). The limits in this permit are water-quality-based effluent limits and result in greater than 85% removal.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19.a. Effluent Limitations/Monitoring Requirements:

Design flow is 0.02 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/D	Est
pH	3	NA	NA	6.0 S.U.	9.0 S.U.	1/D	Grab
BOD_5	3,5	24 mg/L 1.8 kg/day	36 mg/L 2.7 kg/day	NA	NA	1/M	Grab
Total Suspended Solids (TSS)	2	24 mg/L 1.8 kg/day	36 mg/L 2.7 kg/day	NA	NA	1/M	Grab
Dissolved Oxygen	3, 5	NA	NA	6.0 mg/L	NA	1/D	Grab
Ammonia, as N (Jun-Nov)	3	7.3 mg/L	7.3 mg/L	NA	NA	1/M	Grab
E. coli (Geometric Mean)[a] [b]	3, 6	126 n/100mL	NA	NA	NA	1/YR[b]	Grab
Total Residual Chlorine (after contact tank)	2, 4	NA	NA	1.0 mg/L	NA	1/D	Grab
Total Residual Chlorine (after dechlorination)	3	0.025 mg/L	0.030 mg/L	NA	NA	1/D	Grab
Total Kjeldahl Nitrogen (TKN)	7	NL (mg/L)	NA	NA	NA	1/YR	Grab
Nitrate+Nitrite, as N	7	NL (mg/L)	NA	NA	NA	1/YR	Grab
Total Nitrogen[c]	7	NL (mg/L)	NA	NA	NA	1/YR	Calculated
Total Phosphorus	7	NL (mg/L)	NA	NA	NA	1/YR	Grab

The basis for the limitations codes are:

1. Federal Effluent Requirements
2. Best Professional Judgment
3. Water Quality Standards
4. DEQ Disinfection Guidance
5. Stream Model- Attachment 8
6. TMDL Wasteload Allocation
7. Chesapeake Bay WIP

MGD = Million gallons per day.
NA = Not applicable.
NL = No limit; monitor and report.
S.U. = Standard units.

1/D = Once every day.
1/M = Once every month.
1/YR = Once every year.

Est = An estimate of the flow based on the technical evaluation of the sources contributing to the discharge.
Grab = An individual sample collected over a period of time not to exceed 15-minutes.

[a] Samples shall be collected between the hours of 10 A.M. and 4 P.M.

[b] The permittee shall sample and submit *E. coli* results at the frequency of once every week during July each year. A total of 4 weekly samples shall be used to calculate the geometric mean.

[c] Total Nitrogen = Sum of TKN plus Nitrate+Nitrite

19b. Groundwater Monitoring Requirements:

Effective Dates: During the period beginning with the effective date of the permit and lasting until the permit expiration date.

For wells: MW1, MW2 and MW3

PARAMETERS	UNITS	LIMIT	Monitoring Requirements	
			FREQUENCY	SAMPLE TYPE
Static water level	Ft.	NL	1/YR	Measured
pH	S.U.	NL	1/YR	Grab
Conductivity	µmho/cm	NL	1/YR	Grab
Chlorides	mg/L	NL	1/YR	Grab
E. coli	n/100 mL	NL	1/YR	Grab
Nitrates	mg/L	NL	1/YR	Grab
Ammonia as N	mg/L	NL	1/YR	Grab
Total Dissolved Solids	mg/L	NL	1/YR	Grab
Total Organic Carbon	mg/L	NL	1/YR	Grab

1. Annual sampling shall be conducted once each calendar year. Sampling shall be conducted during the summer when the WWTP is operational. Analytical results shall be received by DEQ-NRO by January 10th of the following year.
2. Sampling frequency may be increased to monthly if significant contamination is found.
3. The static water level shall be measured prior to bailing the well water for sampling. At least three volumes of groundwater shall be withdrawn immediately before sampling each well.

1/YR = Once per calendar year.

Grab = An individual sample collected over a period not to exceed 15-minutes.

20. Other Permit Requirements:

a) Part I.B. of the permit contains additional chlorine monitoring requirements, quantification levels and compliance reporting instructions.

These additional chlorine requirements are necessary per the Sewage Collection and Treatment Regulations at 9VAC25-70 and by the Water Quality Standards at 9VAC25-260-170. A minimum chlorine residual must be maintained at the exit of the chlorine contact tank to assure adequate disinfection. No more that 10% of the monthly test results for TRC at the exit of the chlorine contact tank shall be <1.0 mg/L with any TRC <0.6 mg/L considered a system failure. Monitoring at numerous STPs has concluded that a TRC residual of 1.0 mg/L is an adequate indicator of compliance with the *E. coli* criteria. *E. coli* limits are defined in this section as well as monitoring requirements to take effect should an alternate means of disinfection be used.

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

21. Other Special Conditions:

a) 95% Capacity Reopener. The VPDES Permit Regulation at 9VAC25-31-200.B.4. requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. The facility is a PVOTW.

b) Indirect Dischargers. Required by VPDES Permit Regulation, 9VAC25-31-200 B.1. and B.2. for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

c) O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

d) CTC, CTO Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.

e) Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200 C, and Rules and Regulations for Waterworks and Wastewater Works Operators (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class IV operator.

f) Reliability Class. The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet a reliability Class of II.

g) Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220 D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.

h) Treatment Works Closure Plan. The State Water Control Law'§62.1-44.15:1.1, makes it illegal for an owner to cease operation and fail to implement a closure plan when failure to implement the plan would result in harm to human health or the environment. This condition is used to notify the owner of the need for a closure plan where a facility is being replaced or is expected to close.

i) Sludge Reopener. The VPDES Permit Regulation at 9VAC25-31-220.C requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA. The facility includes a sewage treatment works.

j) Sludge Use and Disposal. The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2., and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.

k) Ground Water Monitoring. State Water Control Law § 62.1-1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. Ground water monitoring for parameters of concern will indicate whether possible lagoon seepage is resulting in violations to the State Water Control Board's Ground Water Standards. The ground water monitoring plan dated 28 June 2001 was approved. The plan consisted of the installation of three monitoring wells: MW-1 (control), MW-2 and MW-3; which were monitored quarterly for the parameters listed in Part I.A. Non-compliance with the Plan shall be deemed a violation of the permit. By letter dated August 7, 2009, DEQ-NRO staff granted a reduction in the monitoring frequency from quarterly to annually.

The annual data from 2011 through 2015 was reviewed as part of this reissuance. All *E. coli* samples were below detection. For all years except for 2013, Ammonia as N was nondetectable; in 2013 Ammonia as N was detected in all three monitoring wells with the highest concentration (0.8 mg/L) in the control well MW1. No problems were noted in the groundwater samples for nitrate, chlorides, conductivity, or Total Organic Carbon. It is staff's best professional judgment that the annual monitoring shall continue in the reissued permit. The annual monitoring shall be conducted during the summer when the WWTP is in frequent use.

l) TMDL Reopener: This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.

m) Nutrient Reopener: 9VAC25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

22. Permit Section Part II.

Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

a) Special Conditions:
   1) The language of the O&M Manual Requirement special condition was updated to reflect current agency guidance.
   2) A Nutrient Reopener was added to the special conditions since nutrient monitoring was included with this resissuance.

b) Monitoring and Effluent Limitations:
   1) Annual monitoring for Total Kjeldahl Nitrogen, Nitrate+Nitrite, Total Nitrogen, and Total Phosphorus were added to the permit in support of the Watershed Implementation Plan for the Chesapeake Bay TMDL.

24. Variances/Alternate Limits or Conditions:

None

25. Public Notice Information:

First Public Notice Date: 4/21/2016 Second Public Notice Date: 4/28/2016

Public Notice Information is required by9VAC25-31-280 B. All pertinentinformation is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3834, Alison.Thompson@deq.virginia.gov. See Attachment 9 for a copy of the public notice document.

Persons may comment in writingor by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing Due notice of anypublic hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. Additional Comments:
Previous Board Action(s): None.

Staff Comments: None.

Public Comment: None.

Attachments to the VA0060879 Fact Sheet

Attachment 1	Flow Frequency Determination
Attachment 2	Facility Schematic
Attachment 3	Topographic Map
Attachment 4	Site Inspection
Attachment 5	Planning Statement
Attachment 6	Water Quality Criteria and Wasteload Allocation Determinations pH evaluation Mixing Analysis
Attachment 7	Limit Evaluations
Attachment 8	Dissolved Oxygen Model
Attachment 9	Public Notice

Attachment 1

Flow Frequency Determination

March 10, 2016
MEMORANDUM

TO: VPDES Reissuance File VA0060879

FROM: Alison Thompson

SUBJECT: Flow Frequency Determination for VPDES Permit No. VA0060879
Rapidan Baptist Camp WWTP

COPIES:

This flow frequency analysis is necessary for the VPDES permit reissuance for the Rapidan Baptist Camp WWTP.

The Flow Frequency determination was last done in 2011. During the last reissuance, staff reviewed the 2000 email update and the original 1995 memorandum. Originally a regression analysis was done to determine the critical flow values using flow data from the gage at South River at Route 642 (#01665440) and the gage at Rapidan River near Ruckersville (#01665500). The gage at South River at Route 642 (#01665440) only has data from 1963 and 1981-1983; this gage station is no longer maintained and it was staff's best professional judgment that the flows were no longer appropriate to use. The other gage station used in the original regression analysis, Rapidan River near Ruckersville (#01665500), is still maintained and had up-to-date flow information available in 2011. Since only one of the gage stations had current flow information, the flow frequencies at the outfall location were determined using values at the Rapidan River gauging station at Ruckersville, Virginia, and adjusting them by proportional drainage areas.

There have been no updates to the gage statistics for the Rapidan River at Ruckersville, VA, so the same flow determination shall be used for the 2016 reissuance.

Rapidan River at Ruckersville, VA (#01665440)
(Gauging station data 1942 – 1995, 1999-present)

Drainage area	=	114 sq. mi.
1Q10	=	3.1 cfs
7Q10	=	4.0 cfs
30Q5	=	10 cfs
30Q10	=	7 cfs
High flow 30Q10	=	29 cfs
High flow 1Q10	=	17 cfs
High flow 7Q10	=	21 cfs
HM	=	44 cfs

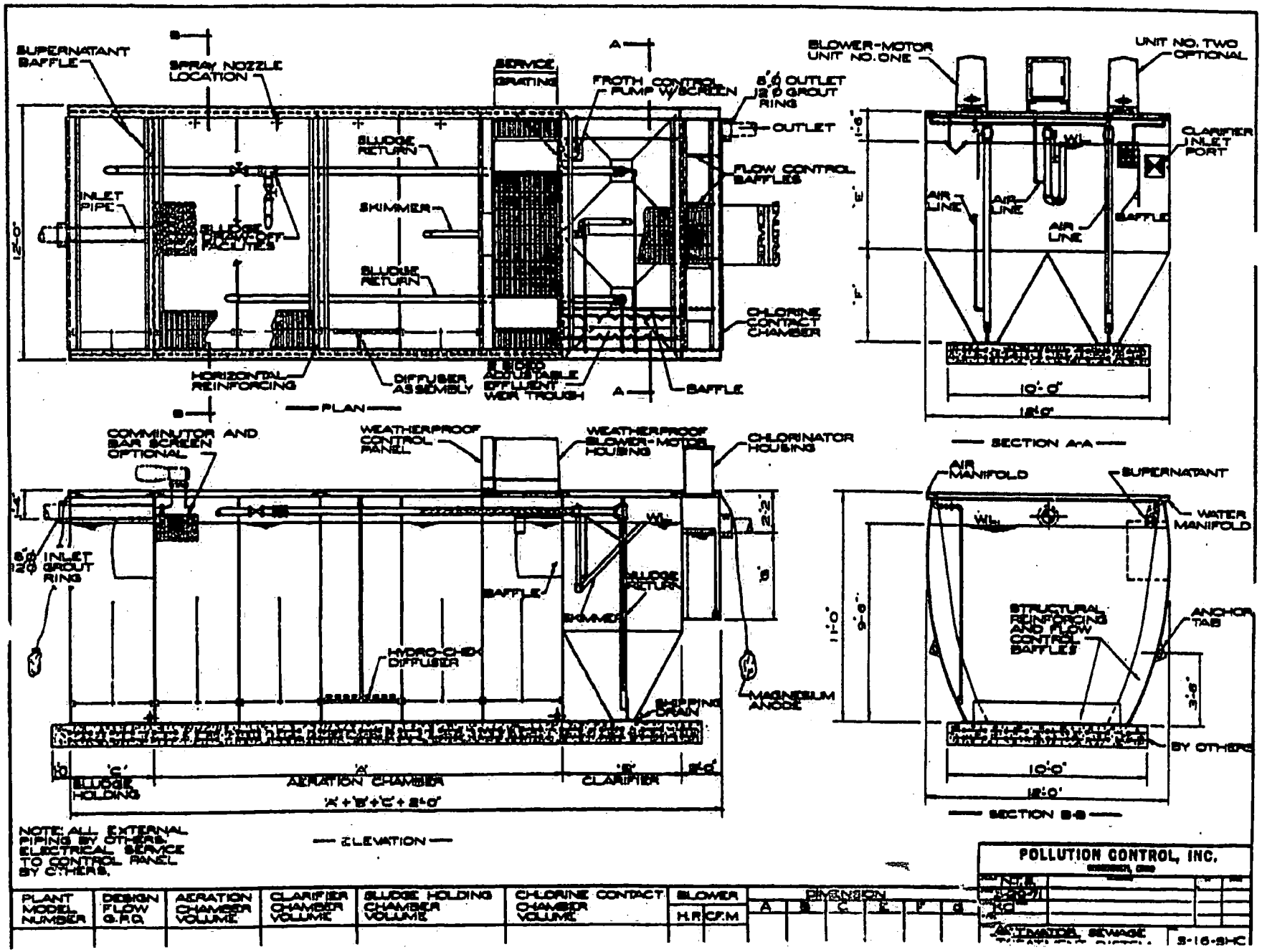
UT, Rapidan River at the Rapidan Baptist Camp WWTP discharge point

Drainage area	=	4.02 sq. mi.	
1Q10	=	0.11 cfs	0.07 MGD
7Q10	=	0.14 cfs	0.09 MGD
30Q5	=	0.35 cfs	0.23 MGD
30Q10	=	0.25 cfs	0.16 MGD
High flow 30Q10	=	1.02 cfs	0.66 MGD
High flow 1Q10	=	0.60 cfs	0.39 MGD
High flow 7Q10	=	0.74 cfs	0.48 MGD
HM	=	1.55 cfs	1.00 MGD

The high flow months are December – May.

Attachment 2

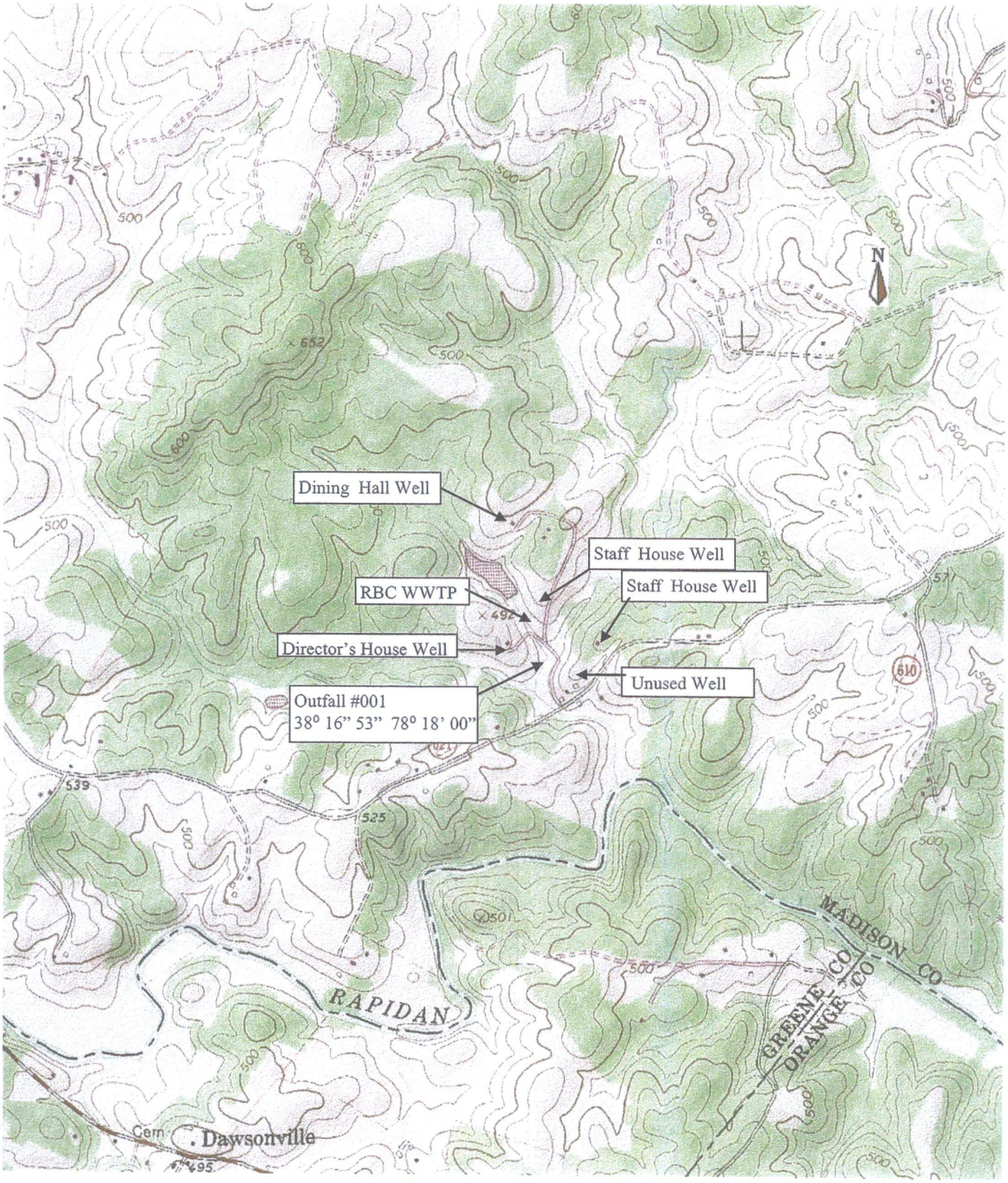
Facility Schematic



Attachment 2

Attachment 3

Topographic Map


Dining Hall Well
Staff House Well
RBC WWTP
Staff House Well
Director's House Well
Unused Well
Outfall #001
38° 16" 53" 78° 18' 00"
N
RAPIDAN
MADISON CO
GREENE CO
ORANGE CO
Cem
Dawsonville
0 0.5 Mi
0 2000 Ft

Appendix (1)

Attachment 4

Site Inspection

October 25, 2005

Mr. Kevin Carlock
Camp Director
Rapidan Baptist Camp & Conference Center
HCR 03, Box 385A
Rochelle, VA 22738

Re: Rapidan Baptist Camp STP – VA0060879

Dear Mr. Carlock:

Enclosed are copies of the facility technical and laboratory inspection reports generated from observations made while performing a Facility Technical Inspection at the **Rapidan Baptist Camp and Conference Center Sewage Treatment Plant** on September 28, 2005. The compliance/monitoring staff would like to thank you and Mr. Wayne Leighan for your time and assistance during the inspection.

Summaries for both the technical and laboratory inspections are enclosed. The facility had **Deficiencies** for the laboratory inspection. Please note the recommendations included in the technical and laboratory summaries.

If you have any questions or comments concerning this report, please feel free to contact me at the Northern Virginia Regional Office at (703) 583-3896 or by E-mail at eabiller@deq.virginia.gov.

Sincerely,

Beth Biller
Environmental Specialist II

cc: Permits / DMR File
Compliance Manager
Compliance Auditor
Compliance Inspector
OWPS - Bill Purcell

DEQ

WASTEWATER FACILITY INSPECTION REPORT

PREFACE

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date
VA0060879	**January 5, 2001**		**January 5, 2006**

Facility Name	Address	Telephone Number
Rapidan Baptist Camp and Conference Center	**Rt. 621 Rochelle, VA 22738**	**(540) 672-0426**
Owner Name	Address	Telephone Number
Rapidan Baptist Camp and Conference Center	**HCR 03, Box 385A, Rochelle, VA 22738**	**(540) 672-0426**
Responsible Official	Title	Telephone Number
Kevin Carlock	**Camp Director**	**(540) 672-0426**
Responsible Operator	Operator Cert. Class/number	Telephone Number
Wayne Leighan	**Class IV**	**(540) 672-6492**

TYPE OF FACILITY:

DOMESTIC				**INDUSTRIAL**			
Federal		Major		Major		Primary	
Non-federal	**X**	Minor	**X**	Minor		Secondary	

INFLUENT CHARACTERISTICS:	DESIGN:
Flow	**0.02**
Population Served	**Varies**
Connections Served	**7**
BOD_5	**Unknown**
TSS	**Unknown**

EFFLUENT LIMITS: SPECIFY UNITS

Parameter	Min.	Avg.	Max.	Parameter	Min.	Avg.	Max.
Flow (MGD)		**0.02**	**NL**	**TRC – Contact**	**1.0**		
pH	**6.0**		**9.0**	**TRC – Inst Max**		**0.025**	**0.03**
BOD_5		**24**	**36**	**TRC – Inst Tech Min**	**0.6**		
TSS		**24**	**36**	**Ammonia as N**		**7.3**	**7.3**
DO	**6.0**						

Receiving Stream	**Rocky Run**
Basin	**Rappahannock**
Discharge Point (LAT)	**78° 18' 00"**
Discharge Point (LONG)	**38° 16' 53"**

VPDES NO. **VA0060879**

DEQ
WASTEWATER FACILITY
INSPECTION REPORT
PART 1

Inspection date: **September 28, 2005**

Date form completed: **October 7, 2005**

Inspection by: **Beth Biller**

Inspection agency: **DEQ - NVRO**

Time spent: **20 hours**

Announced: **Yes**

Reviewed by:

Scheduled: **Yes**

Present at inspection: **Susan Oakes – DEQ**
Kevin Carlock, Wayne Leighan – Rapidan Baptist Camp

TYPE OF FACILITY:

	Domestic	**Industrial**	
[ ] Federal	[ ] Major	[ ] Major	[ ] Primary
[X] Nonfederal	[X] Minor	[ ] Minor	[ ] Secondary

Type of inspection:

[X] Routine
[ ] Compliance/Assistance/Complaint
[ ] Reinspection

Date of last inspection: **May 15, 2000**
Agency: **DEQ - NVRO**

Population served: approx. **Varies**

Connections served: approx. **7**

Last month average: (Effluent) Month/year: **August 2005**
Flow: **0.001 MGD**
pH: **7.96 su**
BOD_5: **6 mg/L**
DO: **8.39 mg/L**
TRC – Contact: **0.74 mg/L**
Ammonia as N: **< QL**

Quarter average: (Effluent) **June, July, August 2005**
Flow: **0.0017 MGD**
pH: **7.56 su**
BOD_5: **5 mg/L**
DO: **7.40 mg/L**
TRC – Contact: **0.71 mg/L**
Ammonia as N: **< QL**

DATA VERIFIED IN PREFACE [X] Updated [ ] No changes

Has there been any new construction? [ ] Yes [X] No

If yes, were plans and specifications approved? [ ] Yes [ ] No

DEQ approval date: **NA**

(A) PLANT OPERATION AND MAINTENANCE

1. Class and number of licensed operators: **1 Class IV**
2. Hours per day plant is manned: **1-2**
3. Describe adequacy of staffing. [ ] Good [**X**] Average [ ] Poor
4. Does the plant have an established program for training personnel? [**X**] Yes [ ] No
5. Describe the adequacy of the training program. [ ] Good [**X**] Average [ ] Poor
6. Are preventive maintenance tasks scheduled? [**X**] Yes [ ] No
7. Describe the adequacy of maintenance. [ ] Good [**X**] Average [ ] Poor*
8. Does the plant experience any organic/hydraulic overloading?
   If yes, identify cause and impact on plant: [ ] Yes [**X**] No
9. Any bypassing since last inspection? [ ] Yes [**X**] No
10. Is the standby electric generator operational? [ ] Yes [ ] No* [**X**] NA
11. Is the STP alarm system operational? [ ] Yes [ ] No* [**X**] NA
12. How often is the standby generator exercised? **NA**
    Power Transfer Switch? **NA**
    Alarm System? **NA**
13. When was the cross connection control device last tested on the potable water service? **NA**
14. Is sludge being disposed in accordance with the approved sludge disposal plan? [**X**] Yes [ ] No [ ] NA
15. Is septage received by the facility? [ ] Yes [**X**] No
    Is septage loading controlled? [ ] Yes [ ] No
    Are records maintained? [ ] Yes [ ] No
16. Overall appearance of facility: [**X**] Good [ ] Average [ ] Poor

Comments:

(B) PLANT RECORDS

1. Which of the following records does the plant maintain?

Operational Logs for each unit process	[**X**] Yes	[ ] No	[ ] NA
Instrument maintenance and calibration	[**X**] Yes	[ ] No	[ ] NA
Mechanical equipment maintenance	[**X**] Yes	[ ] No	[ ] NA
Industrial waste contribution (Municipal Facilities)	[ ] Yes	[ ] No	[**X**] NA

2. What does the operational log contain?

[**X**] Visual observations
[**X**] Laboratory results
[ ] Control calculations
[**X**] Flow measurement
[ ] Process adjustments
[ ] Other (specify)

Comments:

3. What do the mechanical equipment records contain?

[**X**] As built plans and specs
[**X**] Manufacturers instructions
[**X**] Lubrication schedules
[ ] Spare parts inventory
[ ] Equipment/parts suppliers
[ ] Other (specify)

Comments:

4. What do the industrial waste contribution records contain? (Municipal Only)

[ ] Waste characteristics
[ ] Impact on plant
[ ] Locations and discharge types
[ ] Other (specify)

Comments: **NA**

5. Which of the following records are kept at the plant and available to personnel?

[**X**] Equipment maintenance records
[ ] Industrial contributor records
[**X**] Sampling and testing records
[**X**] Operational Log
[**X**] Instrumentation records

6. Records not normally available to plant personnel and their location: **See Note**

7. Were the records reviewed during the inspection? [**X**] Yes [ ] No

8. Are the records adequate and the O & M Manual current? [ ] Yes [**X**] No

9. Are the records maintained for the required 3-year time period? [**X**] Yes [ ] No

Comments:
6) Records not kept at the plant are available at the Camp Director's Office.
8) The O & M Manual is in the process of being revised.

(C) SAMPLING

1. Do sampling locations appear to be capable of providing representative samples? [**X**] Yes [ ] No*
2. Do sample types correspond to those required by the VPDES permit? [**X**] Yes [ ] No*
3. Do sampling frequencies correspond to those required by the VPDES permit? [**X**] Yes [ ] No*
4. Are composite samples collected in proportion to flow? [ ] Yes [ ] No* [**X**] NA
5. Are composite samples refrigerated during collection? [ ] Yes [ ] No* [**X**] NA
6. Does plant maintain required records of sampling? [**X**] Yes [ ] No*
7. Does plant run operational control tests? [**X**] Yes [ ] No

Comments:

(D) TESTING

1. Who performs the testing? [**X**] Plant [ ] Central Lab [**X**] Commercial Lab

Name: **ESS, Culpeper, VA**

If plant performs any testing, complete 2-4.

2. What method is used for chlorine analysis? **DPD – Hach Pocket Colorimeter**
3. Does plant appear to have sufficient equipment to perform required tests? [**X**] Yes [ ] No*
4. Does testing equipment appear to be clean and/or operable? [**X**] Yes [ ] No*

Comments:

(E) FOR INDUSTRIAL FACILITIES WITH TECHNOLOGY BASED LIMITS ONLY

1. Is the production process as described in the permit application? (If no, describe changes in comments)
   [ ] Yes [ ] No [**X**] NA
2. Do products and production rates correspond as provided in the permit application? (If no, list differences)
   [ ] Yes [ ] No [**X**] NA
3. Has the State been notified of the changes and their impact on plant effluent? Date:
   [ ] Yes [ ] No* [**X**] NA

Comments:

SUMMARY

Comments:

- **Plant personnel should be commended for running a well maintained facility.**

Recommendations for action:

- **The O&M Manual is in the process of being revised; submit a copy to DEQ upon completion.**
- **The grass around the facility had recently been mowed, efforts should be made to prevent clippings/clumps from obstructing unit processes.**
- **A path to the outfall needs to be maintained for easy access.**

UNIT PROCESS: Screening/Comminution

1.	Number of Units:	Manual:	**1**	Mechanical:	
	Number in operation:	Manual:	**1**	Mechanical:	
2.	Bypass channel provided:		[ ] Yes	[**X**] No*	
	Bypass channel in use:		[ ] Yes	[ ] No	[**X**] NA
3.	Area adequately ventilated:		[**X**] Yes	[ ] No*	
4.	Alarm system for equipment failure or overloads:		[ ] Yes	[**X**] No*	
5.	Proper flow distribution between units:		[ ] Yes	[ ] No	[**X**] NA
6.	How often are units checked and cleaned?		**Once per day when in use**		
7.	Cycle of operation:		**Continuous**		
8.	Volume of screenings removed:		**unknown**		
9.	General condition:	[**X**] Good	[ ] Fair	[ ] Poor	

Comments:
8) Screenings are disposed of at the Madison County Landfill.

UNIT PROCESS: Activated Sludge Aeration

1. Number of units: **1** In operation: **1**

2. Mode of operation: **extended aeration**

3. Proper flow distribution between units: [ ] Yes [ ] No* [**X**] NA

4. Foam control operational: [ ] Yes [ ] No* [**X**] NA

5. Scum control operational: [ ] Yes [ ] No* [**X**] NA

6. Evidence of following problems:
   a. dead spots [ ] Yes* [**X**] No
   b. excessive foam [ ] Yes* [**X**] No
   c. poor aeration [ ] Yes* [**X**] No
   d. excessive aeration [ ] Yes* [**X**] No
   e. excessive scum [ ] Yes* [**X**] No
   f. aeration equipment malfunction [ ] Yes* [**X**] No
   g. other (identify in comments) [ ] Yes* [**X**] No

7. Mixed liquor characteristics (as available):
   pH:
   MLSS:
   DO:
   SDI/SVI:
   Color:
   Odor:
   Settleability:
   Others (identify):

8. Return/waste sludge:
   A. Return Rate: **Unknown** b. Waste Rate: **Varies** c. Frequency of Wasting: **Varies**

9. Aeration system control: [**X**] Time Clock [ ] Manual [ ] Continuous [ ] Other (explain)

10. Effluent control devices working properly (oxidation ditches): [ ] Yes [ ] No* [**X**] NA

11. General condition: [**X**] Good [ ] Fair [ ] Poor

Comments:

9) Aeration timer is set to operate for 15 minutes every hour. At 7 am and 7 pm the system aerates for 50 minutes.

UNIT PROCESS: Sedimentation

[ ] Primary [**X**] Secondary [ ] Tertiary

1.	Number of units: **1**	In operation: **1**		
2.	Proper flow distribution between units:	[ ] Yes	[ ] No*	[**X**] NA
3.	Signs of short circuiting and/or overloads:	[ ] Yes	[**X**] No	
4.	Effluent weirs level: Clean:	[**X**] Yes [**X**] Yes	[ ] No* [ ] No*	
5.	Scum collection system working properly:	[ ] Yes	[**X**] No*	[ ] NA
6.	Sludge collection system working properly:	[ ] Yes	[**X**] No*	
7.	Influent, effluent baffle systems working properly:	[**X**] Yes	[ ] No*	
8.	Chemical addition: Chemicals:	[ ] Yes	[**X**] No	
9.	Effluent characteristics: **No Discharge**			
10.	General condition:	[**X**] Good	[ ] Fair	[ ] Poor

Comments:
5-6) At the time of inspection there had been little to no discharge for approximately 1 month.

UNIT PROCESS: Ponds/Lagoons

1. Type: [ ] Aerated [**X**] Unaerated [ ] Polishing
2. No. of cells: **1** In operation: **1**
3. Color: [**X**] Green [ ] Brown [ ] Light Brown [ ] Grey [ ] Other:
4. Odor: [ ] Septic* [ ] Earthy [**X**] None [ ] Other:
5. System operated in: [ ] Series [ ] Parallel [**X**] NA
6. If aerated, are lagoon contents mixed adequately? [ ] Yes [ ] No* [**X**] NA
7. If aerated, is aeration system operating properly? [ ] Yes [ ] No* [**X**] NA
8. Evidence of following problems:

a. vegetation in lagoon or dikes	[ ] Yes*	[**X**] No
b. rodents burrowing on dikes	[ ] Yes*	[**X**] No
c. erosion	[ ] Yes*	[**X**] No
d. sludge bars	[ ] Yes*	[**X**] No
e. excessive foam	[ ] Yes*	[**X**] No
f. floating material	[**X**] Yes*	[ ] No

9. Fencing intact: [**X**] Yes [ ] No*
10. Grass maintained properly: [**X**] Yes [ ] No
11. Level control valves working properly: [**X**] Yes [ ] No*
12. Effluent discharge elevation: [**X**] Top [ ] Middle [ ] Bottom
13. Freeboard: **3 - 5 ft.**
14. Appearance of effluent: **No Discharge** [ ] Good [ ] Fair [ ] Poor
15. General condition: [**X**] Good [ ] Fair [ ] Poor
16. Are monitoring wells present? [ ] Yes [**X**] No

    Are wells adequately protected from runoff? [ ] Yes [ ] No* [**X**] NA

    Are caps on and secured? [ ] Yes [ ] No* [**X**] NA

Comments:

8) There is a healthy layer of duckweed floating on the lagoon.
9) The entire facility is fenced.
10) The grass had been recently mowed; efforts need to be made to prevent clippings from falling in and around the system.

UNIT PROCESS: Chlorination

1	No. of chlorinators:	**1**	In operation:	**1**
2.	No. of evaporators:	**0**	In operation:	**0**
3.	No. of chlorine contact tanks:	**1**	In operation:	**0**

4. Proper flow distribution between units: [ ] Yes [ ] No* [**X**] NA

5. How is chlorine introduced into the wastewater?
   [ ] Perforated diffusers
   [ ] Injector with single entry point
   [**X**] Other: **Tablet feeder**

6. Chlorine residual in basin effluent: **NA**

7. Applied chlorine dosage: **varies**

8. Contact basins adequately baffled: [**X**] Yes [ ] No*

9. Adequate ventilation:
   a. cylinder storage area [ ] Yes [ ] No* [**X**] NA
   b. equipment room [ ] Yes [ ] No* [**X**] NA

10. Proper safety precautions used: [**X**] Yes [ ] No*

11. General condition: [**X**] Good [ ] Fair [ ] Poor

Comments:

- **At the time of inspection there had been no flow in or out of the plant. Mr. Leighan noted that the chlorination tank would be drawn down and recycled to the head of the plant before discharge restarted.**

UNIT PROCESS: Dechlorination

1.	Chemical used:	[ ] Sulfur Dioxide	[**X**] Bisulfite	[ ] Other
2.	No. of sulfonators:	**0**	In operation: **0**	
3.	No. of evaporators:	**0**	In operation: **0**	
4.	No. of chemical feeders:	**1**	In operation: **0**	
5.	No. of contact tanks:	**0**	In operation: **0**	
6.	Proper flow distribution between units:	[ ] Yes	[ ] No*	[**X**] NA
7.	How is chemical introduced into the wastewater? [ ] Perforated diffusers [ ] Injector with single entry point [**X**] Other: **Tablet feeder**			
8.	Control system operational:	[ ] Yes	[ ] No*	[**X**] NA
	a. residual analyzers:	[ ] Yes	[**X**] No*	
	b. system adjusted:	[ ] Automatic	[ ] Manual	[**X**] NA:
9.	Applied dechlorination dose:	**varies**		
10.	Chlorine residual in basin effluent:	**NA**		
11.	Contact basins adequately baffled:	[ ] Yes	[ ] No*	[**X**] NA
12.	Adequate ventilation:			
a.	cylinder storage area:	[ ] Yes	[ ] No*	[**X**] NA
b.	equipment room:	[ ] Yes	[ ] No*	[**X**] NA
13.	Proper safety precautions used:	[**X**] Yes	[ ] No*	
14.	General condition:	[**X**] Good	[ ] Fair	[ ] Poor

Comments:

- **There was no discharge at the time of inspection, therefore there was no flow into or out of the unit.**

UNIT PROCESS: Post Aeration

1. Number of units: **1** In operation: **1**

2. Proper flow distribution between units: [ ] Yes [ ] No* [**X**] NA

3. Evidence of following problems:
   a. dead spots [ ] Yes* [**X**] No
   b. excessive foam [ ] Yes* [**X**] No
   c. poor aeration [ ] Yes* [**X**] No
   d. mechanical equipment failure [ ] Yes* [ ] No [**X**] NA

4. How is the aerator controlled? [**X**] Time clock [ ] Manual [ ] Continuous [ ] Other* [ ] NA

5. What is the current operating schedule? **15 minutes on, 15 minutes off**

6. Step weirs level: [ ] Yes [ ] No [**X**] NA

7. Effluent D.O. level:

8. General condition: [**X**] Good [ ] Fair [ ] Poor

Comments:

- **At the time of inspection, there was no flow into or out of the unit due to no discharge from the plant.**

UNIT PROCESS: Aerobic Digestion

1. Number of units: **1** In operation: **0**

2. Type of sludge treated [ ] Primary [**X**] WAS [ ] Other

3. Frequency of sludge application to digestors: **varies as needed**

4. Supernatant return rate: **not measured**

5. pH adjustment provided: [ ] Yes [**X**] No
   Utilized: [ ] Yes [ ] No [**X**] NA

6. Tank contents well-mixed and relatively free of odors: [ ] Yes [ ] No* [**X**] NA

7. If diffused aeration is used, do diffusers require frequent cleaning?
   [ ] Yes [**X**] No [ ] NA

8. Location of supernatant return: [**X**] Head [ ] Primary [ ] Other

9. Process control testing:
   a. reduction of volatile solids [ ] Yes [**X**] No
   b. pH [ ] Yes [**X**] No
   c. alkalinity [ ] Yes [**X**] No
   d. dissolved oxygen [ ] Yes [**X**] No

10. Foaming problem present: [ ] Yes* [**X**] No

11. Signs of short-circuiting or overloads: [ ] Yes* [**X**] No

12. General condition: [**X**] Good [ ] Fair [ ] Poor

Comments:

- **This unit is used as a sludge holding tank. Garth Septic Removal is contracted to pump and haul sludge to Remmington as needed.**

UNIT PROCESS: Effluent/Plant Outfall

1. Type Outfall [**X**] Shore based [ ] Submerged
2. Type if shore based: [ ] Wingwall [ ] Headwall [ ] Rip Rap [**X**] Direct Pipe
3. Flapper valve: [ ] Yes [**X**] No [ ] NA
4. Erosion of bank: [ ] Yes [**X**] No [ ]NA
5. Effluent plume visible? [ ] Yes* [**X**]No
6. Condition of outfall and supporting structures: [**X**] Good [ ] Fair [ ] Poor*
7. Final effluent, evidence of following problems: **No Discharge**
   a. oil sheen [ ] Yes* [ ] No
   b. grease [ ] Yes* [ ] No
   c. sludge bar [ ] Yes* [ ] No
   d. turbid effluent [ ] Yes* [ ] No
   e. visible foam [ ] Yes* [ ] No
   f. unusual color [ ] Yes* [ ] No

Comments:

- **No discharge at the time of inspection.**
- **A path needs to be maintained for access to the outfall structure.**

Attachment 5

Planning Statement

To:	Alison Thompson
From:	Rebecca Shoemaker
Date:	1/6/16
Subject:	Planning Statement for Rapidan Baptist Camp WWTP
Permit Number:	VA0060879

Information for Outfall 001:

Discharge Type:	Municipal
Discharge Flow:	0.02 MGD
Receiving Stream:	Rapidan River, UT
Latitude / Longitude:	38° 16' 53" N, 78° 18' 00" W
Rivermile:	0.52
Streamcode:	3-XBO
Waterbody:	VAN-E13R/RA27
Water Quality Standards:	Section 4, Class III, No special standards
Drainage Area:	4.02 sq. miles

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

   This facility discharges to an unnamed tributary to Rapidan River (streamcode XBO); DEQ ambient monitoring station 3-XBO00.26 is located approximately 0.17 mile downstream from Outfall 001. No samples have been collected at this monitoring station since 2003 and there are no other DEQ ambient monitoring stations within the vicinity of this facility that have recent monitoring data. The following is the water quality summary for this segment of stream XBO, as taken from the Draft 2014 Integrated Report:

   Class III, Section 4.

   DEQ monitoring stations located in this segment:
   - *ambient monitoring station 3-XBO000.26, at Route 621.*

   Although the fecal coliform bacteria criteria are no longer being used for assessment purposes, there has been no or insufficient E. coli bacteria monitoring along this assessment unit reach. The fecal coliform impairment formerly associated with this assessment unit will remain. The recreation use is considered not supported. This impairment is nested within the downstream completed bacteria TMDL for the Rapidan River.

   The aquatic life and wildlife uses are considered fully supporting. The fish consumption use was not assessed.

2. Does this facility discharge to a stream segment on the 303(d) list? If yes, please fill out Table A.

   Yes.

Table A. 303(d) Impairment and TMDL information for the receiving stream segment

Waterbody Name	Impaired Use	Cause	TMDL completed	WLA	Basis for WLA	TMDL Schedule
Impairment Information in the DRAFT 2014 Integrated Report						
Rapidan River, UT	Recreation	*E. coli*	Rapidan River bacteria TMDL 12/05/2007	3.48E+10 cfu/year *E. coli*	126 cfu/100 ml *E. coli* --- 0.020 MGD	---

3. Are there any 303(d) listed impairments within 15 miles downstream that are relevant to this discharge? If yes, please fill out Table B.

   No.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

   There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

   The tidal Rappahannock River, which is located approximately 75 miles downstream of this facility, is listed with a PCB impairment. In support for the PCB TMDL that is scheduled for development by 2016 for the tidal Rappahannock River, this facility is a candidate for low-level PCB monitoring, based upon its designation as a minor municipal discharger. Low-level PCB analysis uses EPA Method 1668, which is capable of detecting low-level concentrations for all 209 PCB congeners. DEQ staff has concluded that low-level PCB monitoring is not warranted for this facility, as it is located in the headwaters of the Rappahannock River and is a small wastewater treatment facility. Based on this information, this facility will not be requested to monitor for low-level PCBs.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

   There is one drinking water intake (for Rapidan Service Authority) located within a five mile radius of Outfall 001.

Attachment 6

Water Quality Criteria and Wasteload Allocation Determination, pH Evaluation, Mixing Analysis

FRESHWATER

Facility Name: Rapidan Baptist Camp WWTP Permit No.: VA0060879

Receiving Stream: Rapidan River, UT Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information			Stream Flows			Mixing Information			Effluent Information		
Mean Hardness (as CaCO3) =	50	mg/L	1Q10 (Annual) =	0.07	MGD	Annual - 1Q10 Mix =	100	%	Mean Hardness (as CaCO3) =	50	mg/L
90% Temperature (Annual) =	26.1	deg C	7Q10 (Annual) =	0.09	MGD	- 7Q10 Mix =	100	%	90% Temp (Annual) =	20	deg C
90% Temperature (Wet season) =	15	deg C	30Q10 (Annual) =	0.16	MGD	- 30Q10 Mix =	100	%	90% Temp (Wet season) =	15	deg C
90% Maximum pH =	7.7	SU	1Q10 (Wet season) =	0.39	MGD	Wet Season - 1Q10 Mix =	100	%	90% Maximum pH =	8.26	SU
10% Maximum pH =		SU	30Q10 (Wet season)	0.66	MGD	- 30Q10 Mix =	100	%	10% Maximum pH =		SU
Tier Designation (1 or 2) =	1		30Q5 =	0.23	MGD				Discharge Flow =	0.02	MGD
Public Water Supply (PWS) Y/N? =	n		Harmonic Mean =	1	MGD						
Trout Present Y/N? =	n										
Early Life Stages Present Y/N? =	y										

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	na	9.9E+02	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+04
Acrolein	0	--	--	na	9.3E+00	--	--	na	1.2E+02	--	--	--	--	--	--	--	--	--	--	na	1.2E+02
Acrylonitrile[C]	0	--	--	na	2.5E+00	--	--	na	1.3E+02	--	--	--	--	--	--	--	--	--	--	na	1.3E+02
Aldrin[C]	0	3.0E+00	--	na	5.0E-04	1.4E+01	--	na	2.6E-02	--	--	--	--	--	--	--	--	1.4E+01	--	na	2.6E-02
Ammonia-N (mg/l) (Yearly)	0	1.27E+01	1.70E+00	na	--	5.70E+01	1.53E+01	na	--	--	--	--	--	--	--	--	--	5.70E+01	1.53E+01	na	--
Ammonia-N (mg/l) (High Flow)	0	1.41E+01	3.43E+00	na	--	2.88E+02	1.17E+02	na	--	--	--	--	--	--	--	--	--	2.88E+02	1.17E+02	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	5.0E+05	--	--	--	--	--	--	--	--	--	--	na	5.0E+05
Antimony	0	--	--	na	6.4E+02	--	--	na	8.0E+03	--	--	--	--	--	--	--	--	--	--	na	8.0E+03
Arsenic	o	3.4E+02	1.5E+02	na	--	1.5E+03	8.3E+02	na	--	--	--	--	--	--	--	--	--	1.5E+03	8.3E+02	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Benzene[C]	0	--	--	na	5.1E+02	--	--	na	2.6E+04	--	--	--	--	--	--	--	--	--	--	na	2.6E+04
Benzidine[C]	0	--	--	na	2.0E-03	--	--	na	1.0E-01	--	--	--	--	--	--	--	--	--	--	na	1.0E-01
Benzo (a) anthracene[C]	0	--	--	na	1.8E-01	--	--	na	9.2E+00	--	--	--	--	--	--	--	--	--	--	na	9.2E+00
Benzo (b) fluoranthene[C]	0	--	--	na	1.8E-01	--	--	na	9.2E+00	--	--	--	--	--	--	--	--	--	--	na	9.2E+00
Benzo (k) fluoranthene[C]	0	--	--	na	1.8E-01	--	--	na	9.2E+00	--	--	--	--	--	--	--	--	--	--	na	9.2E+00
Benzo (a) pyrene[C]	0	--	--	na	1.8E-01	--	--	na	9.2E+00	--	--	--	--	--	--	--	--	--	--	na	9.2E+00
Bis2-Chloroethyl Ether[C]	0	--	--	na	5.3E+00	--	--	na	2.7E+02	--	--	--	--	--	--	--	--	--	--	na	2.7E+02
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	8.1E+05	--	--	--	--	--	--	--	--	--	--	na	8.1E+05
Bis 2-Ethylhexyl Phthalate[C]	0	--	--	na	2.2E+01	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
Bromoform[C]	0	--	--	na	1.4E+03	--	--	na	7.1E+04	--	--	--	--	--	--	--	--	--	--	na	7.1E+04
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	2.4E+04	--	--	--	--	--	--	--	--	--	--	na	2.4E+04
Cadmium	0	1.8E+00	6.6E-01	na	--	8.1E+00	3.6E+00	na	--	--	--	--	--	--	--	--	--	8.1E+00	3.6E+00	na	--
Carbon Tetrachloride[C]	0	--	--	na	1.6E+01	--	--	na	8.2E+02	--	--	--	--	--	--	--	--	--	--	na	8.2E+02
Chlordane[C]	0	2.4E+00	4.3E-03	na	8.1E-03	1.1E+01	2.4E-02	na	4.1E-01	--	--	--	--	--	--	--	--	1.1E+01	2.4E-02	na	4.1E-01
Chloride	0	8.6E+05	2.3E+05	na	--	3.9E+06	1.3E+06	na	--	--	--	--	--	--	--	--	--	3.9E+06	1.3E+06	na	--
TRC	0	1.9E+01	1.1E+01	na	--	8.6E+01	6.1E+01	na	--	--	--	--	--	--	--	--	--	8.6E+01	6.1E+01	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	2.0E+04	--	--	--	--	--	--	--	--	--	--	na	2.0E+04

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	6.6E+03	--	--	--	--	--	--	--	--	--	--	na	6.6E+03
Chloroform	0	--	--	na	1.1E+04	--	--	na	1.4E+05	--	--	--	--	--	--	--	--	--	--	na	1.4E+05
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	2.0E+04	--	--	--	--	--	--	--	--	--	--	na	2.0E+04
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	1.9E+03	--	--	--	--	--	--	--	--	--	--	na	1.9E+03
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	3.7E-01	2.3E-01	na	--	--	--	--	--	--	--	--	--	3.7E-01	2.3E-01	na	--
Chromium III	0	3.2E+02	4.2E+01	na	--	1.5E+03	2.3E+02	na	--	--	--	--	--	--	--	--	--	1.5E+03	2.3E+02	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	7.2E+01	6.1E+01	na	--	--	--	--	--	--	--	--	--	7.2E+01	6.1E+01	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Chrysene[C]	0	--	--	na	1.8E-02	--	--	na	9.2E-01	--	--	--	--	--	--	--	--	--	--	na	9.2E-01
Copper	0	7.0E+00	5.0E+00	na	--	3.1E+01	2.7E+01	na	--	--	--	--	--	--	--	--	--	3.1E+01	2.7E+01	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	9.9E+01	2.9E+01	na	2.0E+05	--	--	--	--	--	--	--	--	9.9E+01	2.9E+01	na	2.0E+05
DDD[C]	0	--	--	na	3.1E-03	--	--	na	1.6E-01	--	--	--	--	--	--	--	--	--	--	na	1.6E-01
DDE[C]	0	--	--	na	2.2E-03	--	--	na	1.1E-01	--	--	--	--	--	--	--	--	--	--	na	1.1E-01
DDT[C]	0	1.1E+00	1.0E-03	na	2.2E-03	5.0E+00	5.5E-03	na	1.1E-01	--	--	--	--	--	--	--	--	5.0E+00	5.5E-03	na	1.1E-01
Demeton	0	--	1.0E-01	na	--	--	5.5E-01	na	--	--	--	--	--	--	--	--	--	--	5.5E-01	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	7.7E-01	9.4E-01	na	--	--	--	--	--	--	--	--	--	7.7E-01	9.4E-01	na	--
Dibenz(a,h)anthracene[C]	0	--	--	na	1.8E-01	--	--	na	9.2E+00	--	--	--	--	--	--	--	--	--	--	na	9.2E+00
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	1.6E+04	--	--	--	--	--	--	--	--	--	--	na	1.6E+04
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	1.2E+04	--	--	--	--	--	--	--	--	--	--	na	1.2E+04
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	2.4E+03	--	--	--	--	--	--	--	--	--	--	na	2.4E+03
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	1.4E+01	--	--	--	--	--	--	--	--	--	--	na	1.4E+01
Dichlorobromomethane[C]	0	--	--	na	1.7E+02	--	--	na	8.7E+03	--	--	--	--	--	--	--	--	--	--	na	8.7E+03
1,2-Dichloroethane[C]	0	--	--	na	3.7E+02	--	--	na	1.9E+04	--	--	--	--	--	--	--	--	--	--	na	1.9E+04
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	8.9E+04	--	--	--	--	--	--	--	--	--	--	na	8.9E+04
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	1.3E+05	--	--	--	--	--	--	--	--	--	--	na	1.3E+05
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	3.6E+03	--	--	--	--	--	--	--	--	--	--	na	3.6E+03
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	7.7E+03	--	--	--	--	--	--	--	--	--	--	na	7.7E+03
1,3-Dichloropropene[C]	0	--	--	na	2.1E+02	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
Dieldrin[C]	0	2.4E-01	5.6E-02	na	5.4E-04	1.1E+00	3.1E-01	na	2.8E-02	--	--	--	--	--	--	--	--	1.1E+00	3.1E-01	na	2.8E-02
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	5.5E+05	--	--	--	--	--	--	--	--	--	--	na	5.5E+05
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	1.1E+04	--	--	--	--	--	--	--	--	--	--	na	1.1E+04
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	1.4E+07	--	--	--	--	--	--	--	--	--	--	na	1.4E+07
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	5.6E+04	--	--	--	--	--	--	--	--	--	--	na	5.6E+04
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	6.6E+04	--	--	--	--	--	--	--	--	--	--	na	6.6E+04
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	3.5E+03	--	--	--	--	--	--	--	--	--	--	na	3.5E+03
2,4-Dinitrotoluene[C]	0	--	--	na	3.4E+01	--	--	na	1.7E+03	--	--	--	--	--	--	--	--	--	--	na	1.7E+03
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	6.4E-07	--	--	--	--	--	--	--	--	--	--	na	6.4E-07
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	1.0E+02	--	--	--	--	--	--	--	--	--	--	na	1.0E+02
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	9.9E-01	3.1E-01	na	1.1E+03	--	--	--	--	--	--	--	--	9.9E-01	3.1E-01	na	1.1E+03
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	9.9E-01	3.1E-01	na	1.1E+03	--	--	--	--	--	--	--	--	9.9E-01	3.1E-01	na	1.1E+03
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	9.9E-01	3.1E-01	--	--	--	--	--	--	--	--	--	--	9.9E-01	3.1E-01	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	1.1E+03	--	--	--	--	--	--	--	--	--	--	na	1.1E+03
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	3.9E-01	2.0E-01	na	7.5E-01	--	--	--	--	--	--	--	--	3.9E-01	2.0E-01	na	7.5E-01
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	3.8E+00	--	--	--	--	--	--	--	--	--	--	na	3.8E+00

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	2.6E+04	--	--	--	--	--	--	--	--	--	--	na	2.6E+04
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	1.8E+03	--	--	--	--	--	--	--	--	--	--	na	1.8E+03
Fluorene	0	--	--	na	5.3E+03	--	--	na	6.6E+04	--	--	--	--	--	--	--	--	--	--	na	6.6E+04
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	5.5E-02	na	--	--	--	--	--	--	--	--	--	--	5.5E-02	na	--
Heptachlor[C]	0	5.2E-01	3.8E-03	na	7.9E-04	2.3E+00	2.1E-02	na	4.0E-02	--	--	--	--	--	--	--	--	2.3E+00	2.1E-02	na	4.0E-02
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	2.3E+00	2.1E-02	na	2.0E-02	--	--	--	--	--	--	--	--	2.3E+00	2.1E-02	na	2.0E-02
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	1.5E-01	--	--	--	--	--	--	--	--	--	--	na	1.5E-01
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	9.2E+03	--	--	--	--	--	--	--	--	--	--	na	9.2E+03
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	2.5E+00	--	--	--	--	--	--	--	--	--	--	na	2.5E+00
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	8.7E+00	--	--	--	--	--	--	--	--	--	--	na	8.7E+00
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	4.3E+00	--	na	9.2E+01	--	--	--	--	--	--	--	--	4.3E+00	--	na	9.2E+01
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	1.4E+04	--	--	--	--	--	--	--	--	--	--	na	1.4E+04
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	1.7E+03	--	--	--	--	--	--	--	--	--	--	na	1.7E+03
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	1.1E+01	na	--	--	--	--	--	--	--	--	--	--	1.1E+01	na	--
Indeno (1,2,3-cd) pyrene[C]	0	--	--	na	1.8E-01	--	--	na	9.2E+00	--	--	--	--	--	--	--	--	--	--	na	9.2E+00
Iron	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	4.9E+05	--	--	--	--	--	--	--	--	--	--	na	4.9E+05
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Lead	0	4.9E+01	5.6E+00	na	--	2.2E+02	3.1E+01	na	--	--	--	--	--	--	--	--	--	2.2E+02	3.1E+01	na	--
Malathion	0	--	1.0E-01	na	--	--	5.5E-01	na	--	--	--	--	--	--	--	--	--	--	5.5E-01	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	6.3E+00	4.2E+00	--	--	--	--	--	--	--	--	--	--	6.3E+00	4.2E+00	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	1.9E+04	--	--	--	--	--	--	--	--	--	--	na	1.9E+04
Methylene Chloride[C]	0	--	--	na	5.9E+03	--	--	na	3.0E+05	--	--	--	--	--	--	--	--	--	--	na	3.0E+05
Methoxychlor	0	--	3.0E-02	na	--	--	1.7E-01	na	--	--	--	--	--	--	--	--	--	--	1.7E-01	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	--	--	--	--	--	--	--	--	0.0E+00	na	--
Nickel	0	1.0E+02	1.1E+01	na	4.6E+03	4.6E+02	6.2E+01	na	5.8E+04	--	--	--	--	--	--	--	--	4.6E+02	6.2E+01	na	5.8E+04
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	8.6E+03	--	--	--	--	--	--	--	--	--	--	na	8.6E+03
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	1.5E+03	--	--	--	--	--	--	--	--	--	--	na	1.5E+03
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	3.1E+03	--	--	--	--	--	--	--	--	--	--	na	3.1E+03
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	2.6E+02	--	--	--	--	--	--	--	--	--	--	na	2.6E+02
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.3E+02	3.6E+01	na	--	--	--	--	--	--	--	--	--	1.3E+02	3.6E+01	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	2.9E-01	7.2E-02	na	--	--	--	--	--	--	--	--	--	2.9E-01	7.2E-02	na	--
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	7.7E-02	na	3.3E-02	--	--	--	--	--	--	--	--	--	7.7E-02	na	3.3E-02
Pentachlorophenol[C]	0	7.7E-03	5.9E-03	na	3.0E+01	3.5E-02	3.2E-02	na	1.5E+03	--	--	--	--	--	--	--	--	3.5E-02	3.2E-02	na	1.5E+03
Phenol	0	--	--	na	8.6E+05	--	--	na	1.1E+07	--	--	--	--	--	--	--	--	--	--	na	1.1E+07
Pyrene	0	--	--	na	4.0E+03	--	--	na	5.0E+04	--	--	--	--	--	--	--	--	--	--	na	5.0E+04
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
(pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	9.0E+01	2.8E+01	na	5.3E+04	--	--	--	--	--	--	--	--	**9.0E+01**	**2.8E+01**	**na**	**5.3E+04**
Silver	0	1.0E+00	--	na	--	4.7E+00	--	na	--	--	--	--	--	--	--	--	--	**4.7E+00**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	2.0E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**2.0E+03**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	1.7E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.7E+03**
Thallium	0	--	--	na	4.7E-01	--	--	na	5.9E+00	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**5.9E+00**
Toluene	0	--	--	na	6.0E+03	--	--	na	7.5E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**7.5E+04**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Toxaphene[C]	0	7.3E-01	2.0E-04	na	2.8E-03	3.3E+00	1.1E-03	na	1.4E-01	--	--	--	--	--	--	--	--	**3.3E+00**	**1.1E-03**	**na**	**1.4E-01**
Tributyltin	0	4.6E-01	7.2E-02	na	--	2.1E+00	4.0E-01	na	--	--	--	--	--	--	--	--	--	**2.1E+00**	**4.0E-01**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	8.8E+02	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.8E+02**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	8.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**8.2E+03**
Trichloroethylene[C]	0	--	--	na	3.0E+02	--	--	na	1.5E+04	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.5E+04**
2,4,6-Trichlorophenol[C]	0	--	--	na	2.4E+01	--	--	na	1.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+03**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	1.2E+03	--	--	--	--	--	--	--	--	**--**	**--**	**na**	**1.2E+03**
Zinc	0	6.5E+01	6.6E+01	na	2.6E+04	2.9E+02	3.6E+02	na	3.3E+05	--	--	--	--	--	--	--	--	**2.9E+02**	**3.6E+02**	**na**	**3.3E+05**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	8.0E+03
Arsenic	5.0E+02
Barium	na
Cadmium	2.2E+00
Chromium III	1.4E+02
Chromium VI	2.9E+01
Copper	1.3E+01
Iron	na
Lead	1.8E+01
Manganese	na
Mercury	2.5E+00
Nickel	3.7E+01
Selenium	1.7E+01
Silver	1.9E+00
Zinc	1.2E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

Mixing Zone Predictions for Rapidan Baptist Camp WWTP

Effluent Flow = 0.02 MGD
Stream 7Q10 = .48 MGD
Stream 30Q10 = .66 MGD
Stream 1Q10 = .39 MGD
Stream slope = .001 ft/ft
Stream width = 10 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .3685 ft
Length = 209.26 ft
Velocity = .21 ft/sec
Residence Time = .0115 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .4458 ft
Length = 176.85 ft
Velocity = .2361 ft/sec
Residence Time = .0087 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .3262 ft
Length = 232.87 ft
Velocity = .1946 ft/sec
Residence Time = .3324 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Mixing Zone Predictions for Rapidan Baptist Camp WWTP

Effluent Flow = 0.02 MGD
Stream 7Q10 = .09 MGD
Stream 30Q10 = .16 MGD
Stream 1Q10 = .07 MGD
Stream slope = .001 ft/ft
Stream width = 5 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .2266 ft
Length = 77.62 ft
Velocity = .1503 ft/sec
Residence Time = .006 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .3081 ft
Length = 58.92 ft
Velocity = .1808 ft/sec
Residence Time = .0038 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .2001 ft
Length = 86.7 ft
Velocity = .1392 ft/sec
Residence Time = .173 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Station_ID	Station_Description	Collection_Date_Time	Field_pH	DO_Probe	Temp_Celsuis
3-XBO000.26	Rt. # 621	08/15/01	7.01	6.37	24.06
3-XBO000.26	Rt. # 621	02/12/03	7.17	13.31	2.31
3-XBO000.26	Rt. # 621	03/18/03	7.22	10.02	12.64
3-XBO000.26	Rt. # 621	04/30/03	7.38	11.37	14.19
3-XBO000.26	Rt. # 621	05/27/03	6.86	8.3	15.09
3-XBO000.26	Rt. # 621	06/17/03	7.01	8.37	17.15
		90th percentile	7.38		24.06

VA0060879 Rapidan Baptist Camp WWTP

Monitoring period	Minimum pH reported (S.U.)	Maximum pH reported (S.U.)
October 2015	8.05	8.35
August 2015	7.94	8.34
July 2015	7.69	8.10
June 2015	7.68	8.11
August 2014	7.83	8.05
July 2014	7.74	8.21
June 2014	7.72	8.05
May 2014	7.23	7.97
April 2014	7.7	8.2
August 2013	7.92	8.21
July 2013	7.9	8.13
June 2013	7.91	8.26
August 2012	7.85	8.34
July 2012	7.75	8.34
June 2012	7.78	8.28
October 2011	7.91	8.24
September 2011	7.95	8.12
August 2011	7.92	8.24
July 2011	7.82	8.55
June 2011	6.62	8.08

Month/Year	Date	Time	pH of effluent
Jun-08	17	19:10	8.27
Jun-08	18	19:00	8.29
Jun-08	19	19:58	7.75
Jun-08	20	17:21	7.98
Jun-08	21	10:33	7.99
Jun-08	22	14:44	7.95
Jun-08	23	19:02	7.92
Jun-08	24	20:04	7.85
Jun-08	25	19:42	7.88
Jun-08	26	19:40	7.96
Jun-08	27	19:24	7.8
Jun-08	28	15:07	7.76
Jun-08	29	15:55	7.97
Jun-08	30	19:38	7.98
Jul-08	1	7:00	8.19
Jul-08	2	17:51	8.24
Jul-08	6	13:35	8.12
Jul-08	7	18:51	8.29
Jul-08	9	19:10	7.67
Jul-08	10	19:15	7.85
Jul-08	14	19:10	8.3
Jul-08	15	19:25	7.85
Jul-08	16	19:23	7.95
Jul-08	17	7:55	7.96
Jul-08	18	7:52	7.86
Jul-08	19	8:00	7.87
Jul-08	20	14:35	8.03
Jul-08	21	19:35	7.94
Jul-08	22	7:05	8.01
Jul-08	23	18:53	7.88
Jul-08	24	7:05	7.89
Jul-08	25	7:30	7.95
Jul-08	26	10:05	7.98
Jul-08	27	13:15	7.94
Jul-08	28	7:10	8.05
Jul-08	29	18:59	8.28
Jul-08	30	7:05	7.83
Jul-08	31	7:15	7.89
Aug-08	1	7:15	7.86
Aug-08	2	7:10	8.1
Aug-08	3	18:15	8.1
Aug-08	4	19:27	7.85
Aug-08	5	18:40	8.08
Aug-08	6	18:28	8.03

90th percentile pH 8.26

Aug-08	7	18:37	8.08
Aug-08	8	19:13	7.95
Aug-08	9	13:25	8.25
Aug-08	11	16:08	7.9
Aug-08	12	7:10	8.11
Aug-08	13	7:20	8.7
Aug-08	14	7:10	8.26
Aug-08	15	7:10	7.86
Aug-08	16	7:10	8.3
Jun-09	3	17:17	7.49
Jun-09	4	15:55	7.78
Jun-09	5	16:53	7.36
Jun-09	6	8:53	7.84
Jun-09	10	19:40	7.88
Jun-09	11	16:30	8.04
Jun-09	12	18:15	8.2
Jun-09	13	20:15	7.78
Jun-09	14	7:05	7.89
Jun-09	16	7:03	8.08
Jun-09	17	7:51	7.93
Jun-09	18	7:10	7.94
Jun-09	19	7:00	7.78
Jun-09	20	19:05	7.83
Jun-09	21	15:35	7.77
Jun-09	22	7:10	7.8
Jun-09	23	7:05	7.84
Jun-09	24	7:05	7.82
Jun-09	25	7:01	7.77
Jun-09	26	7:05	7.81
Jun-09	27	7:01	7.81
Jun-09	30	7:05	7.8
Jul-09	3	19:21	7.71
	4	7:01	7.81
	5	14:05	8.02
	6	20:25	7.73
	7	7:09	7.84
	8	7:10	7.78
	9	19:35	7.84
	10	7:10	7.93
	11	8:30	7.97
	13	19:15	8.28
	14	7:10	7.92
	15	7:10	7.81
	16	7:14	7.78
	17	16:55	7.77
	18	9:00	7.63
	20	19:20	7.67

	21	7:10	7.75
	22	7:30	7.63
	23	7:05	7.58
	24	7:05	7.60
	25	10:44	7.70
	26	16:01	7.88
	27	7:07	7.87
	28	7:09	7.88
	29	7:11	7.91
	30	8:00	7.85
Jul-09	31	7:17	7.68
Aug-09	1	7:08	7.8
	2	14:02	7.82
	3	7:15	7.9
	4	7:11	8.06
	5	7:15	8.07
	6	7:28	7.95
	7	7:09	7.91
	8	7:10	7.79
	9	14:40	7.72
	10	19:25	7.79
	11	8:45	7.78
	12	9:50	7.76
	13	9:30	7.83
	14	13:10	8
	15	17:30	7.98
	16	15:05	7.9
	17	8:45	7.99
	19	17:16	7.94
	20	8:15	7.78
Aug-09	21	11:26	7.97
Mar-10	19	19:30	7.95
	20	12:40	7.67
	21	18:00	7.78
	22	13:15	7.52
	23	9:00	8.61
Mar-10	24	16:30	7.67
Jun-10	16	7:10	8.18
	17	7:05	7.96
	18	7:20	8.18
	19	8:40	8.2
	20	15:30	8.16
	21	7:10	7.99
	22	7:05	7.84
	23	7:08	7.59
	24	7:05	7.71

	25	7:00	7.81
Jun-10	30	7:00	7.89
Jul-10	1	7:04	8.05
	2	7:07	8.39
	3	7:20	8.17
	4	15:05	8.23
	5	7:53	8.17
	6	7:55	8.02
	7	7:10	8.01
	8	7:20	7.96
	9	7:46	8.3
	10	9:15	8.04
	12	20:20	7.9
	13	7:15	8
	14	7:13	7.97
	15	7:15	7.92
	16	7:20	7.93
	17	9:45	8.1
	19	20:20	7.89
	20	7:10	8.19
	21	7:08	7.93
	22	7:20	8.04
	23	7:25	8.04
	24	17:25	8.08
	26	19:30	8.43
	30	19:40	8.24
Jul-10	31	7:36	8.27
Aug-10	1	15:30	8.25
	2	7:20	8.32
	3	7:32	8.16
	4	7:05	8.28
	5	7:08	8.28
	6	7:05	8.28
	24	17:00	8.03
Aug-10	25	8:15	8.07

Attachment 7

Limit Evaluations

3/17/2016 1:15:22 PM

Facility = Rapidan Baptist Camp WWTP
Chemical = Ammonia as N
Chronic averaging period = 30
WLAa = 57
WLAc = 15.3
Q.L. = .2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

9

Analysis of the Rapidan Baptist Youth Camp (Jun-May Season) effluent data fo
Ammonia

The statistics for Ammonia are:

Number of values	=	1
Quantification level	=	.2
Number < quantification	=	0
Expected value	=	10
Variance	=	36.00001
C.V.	=	.6
97th percentile	=	24.33418
Statistics used	=	Reasonable potential assumptions - Type 2 data

The WLAs for Ammonia are:

Acute WLA	=	30.82831
Chronic WLA	=	5.01928
Human Health WLA	=	----

The limits are based on chronic toxicity and 1 samples/month.

Maximum daily limit	=	7.341073
Average monthly limit	=	7.341073

7.3 MG/L

1. -- -----

DATA
10

Analysis of the Rapidan Baptist Youth Camp (Dec-May Season) effluent data fo
Ammonia

The statistics for Ammonia are:

Number of values	=	1
Quantification level	=	.2
Number < quantification	=	0
Expected value	=	10
Variance	=	36.00001
C.V.	=	.6
97th percentile	=	24.33418
Statistics used	=	Reasonable potential assumptions - Type 2 data

The WLAs for Ammonia are:

Acute WLA	=	250.617
Chronic WLA	=	54.35336
Human Health WLA	=	----

The limits are based on chronic toxicity and 1 samples/month.

NO LIMIT NEEDED FOR Ammonia

DATA
10

Limit from 1995-2000 permit

3/17/2016 1:18:02 PM

Facility = Rapidan Baptist Camp WWTP
Chemical = TRC
Chronic averaging period = 4
WLAa = 86
WLAc = 61
Q.L. = 100
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 200
Variance = 14400
C.V. = 0.6
97th percentile daily values = 486.683
97th percentile 4 day average = 332.758
97th percentile 30 day average= 241.210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 86
Average Weekly limit = 51.2994373875911
Average Monthly LImit = 42.6234200926204

The data are:

200

2006 Limit Evaluation

Facility = Rapidan Baptist Camp STP
Chemical = Chlorine
Chronic averaging period = 30
WLAa = 51
WLAc = 37
Q.L. = 100
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 200
Variance = 14400
C.V. = 0.6
97th percentile daily values = 486.683
97th percentile 4 day average = 332.758
97th percentile 30 day average= 241.210
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 51
Average Weekly limit = 30.4217593810133 mg/L
Average Monthly LImit = 25.2766793572516 mg/L

The data are:

200

AVG. WEEKLY LIMIT = 0.03 mg/L

AVG MONTHLY LIMIT = 0.025 mg/L

Attachment 8

Dissolved Oxygen Model

MEMORANDUM

State Water Control Board

2111 North Hamilton Street | P. O. Box 11143 | Richmond, VA. 23230

SUBJECT: Madison County-LHS 120-Baptist Youth Camp

TO: File

FROM: Gary N. Moore

DATE: November 29, 1973

COPIES:

Rochelle Quadrangle
Proposed plant: .02 MGD
POD will be downstream from the lake, 200 ft. (north side of) above Rocky Run, approximately .5 mi. above the Rapidan.
Off Route 621 between U.S. 29 and Rochelle, Virginia on north and south side of Route 621.

Q = .0081 MGD DA above POD = .28 mi^2
Q = .0711 MGD DA of South Fork of Rocky Run = 2.45 mi^2
Q = .1074 MGD DA above confluence of unnamed tributary and North Fork Rocky Run = 3.7 mi^2

Critical flow = .045 cfs/sq. mi. (Rapidan River near Ruckersville)
DA of Rapidan River above gaging station near Ruckersville =111 mi^2
DA between gaging station and confluence of Rocky Run and Rapidan River = 16.6 mi^2

Q = 3.70 MGD Total DA of Rapidan River above the point where Rocky Run enters it = 111+16.6 = 127.6 mi^2
Distance from POD to Rocky Run = .04 mi.
Distance from North Fork Rocky Run to South Fork Rocky Run = .1 mi
Distance from confluence of Rocky Run to Rapidan River=.4 mi

GNM/by

NOTE: ACCORDING TO RECENT TOPO, UT, ROCKY RUN IS NOW CALLED RAPIDAN RIVER, UT.

Attachment 7

MEMORANDUM

State Water Control Board

2111 North Hamilton Street | P. O. Box 11143 | Richmond, VA. 23230

SUBJECT: Madison County - Baptist Youth Camp, Inc.

TO: file

FROM: Gary N. Moore

DATE: November 14, 1973

COPIES:

On November 13, 1973, the writer inspected the site of the subject proposed discharge. The discharge is proposed to be into an unnamed tributary of Rocky Run, 200 feet above its confluence with Rocky Run. Observations were made at the POD, 100 feet below the confluence of the unnamed tributary and Rocky Run, and at Rocky Run at the Route 621 bridge.

Observed Data:

	POD	100 ft. below confluence of tributary and Rocky Run	Rocky Run at 621 bridge
Width (ft.)	1-2	6-10	10-15
Depth (in.)	4-8	4- 8	6-10
Flow (ft. $sec.^{-1}$)	1	1	1
Air Temp (^{o}C)	20	20	20
Water Temp (^{o}C)	9	9	9
D.O. (mg/l)	10	10.2	11
Bottom	rocky	silt	rocky, sandy

No other discharges in the vicinity have been noted.

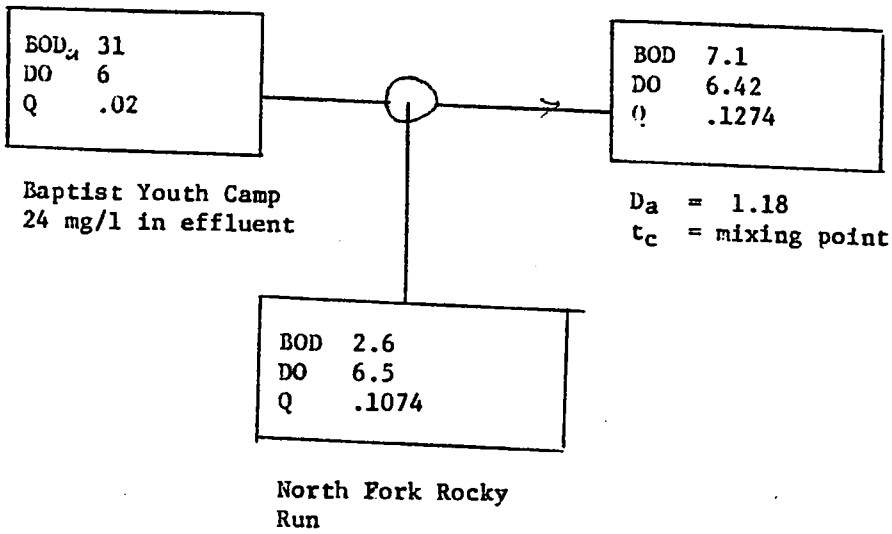
GNM:by

Madison Co. - Baptist Youth Camp - 11/28/73

SAA

Ka_{30} = 2 * 1.22 = 2.44 day^{-1}
Kd_{30} = .2 * 1.48 = .296 day^{-1}

Effluent: 24 mg/l (4 lbs/day) BOD and SS



Meets non-degradation if effluent is transported to Rocky Run.

GNM/z

Attachment 9

Public Notice

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Madison County, Virginia.

PUBLIC COMMENT PERIOD: April 21, 2016 to May 23, 2016

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board.

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Rapidan Baptist Camp, PO Box 10, Rochelle, VA 22738 VA0060879

NAME AND ADDRESS OF FACILITY: Rapidan Baptist Camp, 177 Baptist Camp Drive, Rochelle, VA 22738

PROJECT DESCRIPTION: Rapidan Baptist Camp has applied for a reissuance of a permit for the private Rapidan Baptist Camp WWTP. The applicant proposes to release treated sewage wastewaters from the summer camp and conference center at a rate of 0.02 million gallons per day into a water body. The sludge will be disposed by pump and haul to an approved facility for further treatment and disposal. The facility proposes to release the treated sewage in an unnamed tributary to the Rapidan River in Madison County in the Rappahannock watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, BOD, Total Suspended Solids, Ammonia as N, *E. coli*, Total Residual Chlorine and Dissolved Oxygen. The following pollutants will be monitored without limitation: Flow, Total Nitrogen, Total Kjeldahl Nitrogen, Nitrate+Nitrite, and Total Phosphorus.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by hand-delivery, e-mail, or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.
Name: Alison Thompson
Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193
Phone: (703) 583-3834 E-mail: Alison.Thompson@deq.virginia.gov